

WHAT IS CLAIMED IS:

1. A process for the adsorption of gases comprising adsorbing the gases in an open, closed, or partially closed system or space with a monodisperse aminomethylated bead polymer based on at least one monovinylaromatic compound and at least one polyvinylaromatic compound and having a porosity of from 40 to 70%, wherein the bead polymers are prepared by a process comprising
  - (a) reacting monomer droplets made from at least one monovinylaromatic compound and at least one polyvinylaromatic compound, and, if desired, a porogen and/or, if desired, an initiator or an initiator combination to give a monodisperse, crosslinked bead polymer,
  - (b) amidomethylating the monodisperse, crosslinked bead polymer using phthalimide derivatives, and
  - (c) converting the amidomethylated bead polymer to an amino-methylated bead polymer.
2. A process according to Claim 1 wherein the degree of crosslinking of the monodisperse aminomethylated bead polymer is from 2 to 90%.
3. A process according to Claim 1 wherein the average pore diameter of the monodisperse aminomethylated bead polymer is from 100 to 900 Angstrom.
4. A process according to Claim 1 wherein the concentration of the functional groups of the monodisperse aminomethylated bead polymer is from 0.2 to 3.0 mol/l.
5. A process according to Claim 1 wherein the monodisperse aminomethylated bead polymer is used in the form of a bed.
6. A process according to Claim 5 wherein the gases are acidic gases or organic gases or vapors.

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7. A process according to Claim 6 wherein the acidic gases are CO, CO<sub>2</sub>, NO, NO<sub>2</sub>, N<sub>2</sub>O, N<sub>2</sub>O<sub>5</sub>, SO<sub>2</sub>, SO<sub>3</sub>, HCl, HBr, H<sub>2</sub>S, HCN, dicyan, or phosgene.

5 8. A process according to Claim 5 wherein the open, closed, or partially closed system or space is a survival system for spacecraft, vehicles, buildings, plants, aircraft, mines, or chemical factories; a respiratory device; a survival system in the medical sector; or diving equipment.

10 9. A process according to Claim 5 wherein the open, closed, or partially closed system or space is a respiratory protection mask, protective clothing, or a survival system.

15 10. A respiratory protection mask, protective clothing, or a survival system provided with a monodisperse aminomethylated bead polymer in the form of a bed according to Claim 5 in an amount sufficient to remove acidic gases or organic gases or vapors over prolonged periods by adsorption.

20 11. A process for regenerating monodisperse aminomethylated bead polymers that have been saturation with acidic gases or with organic gases or vapors comprising  
(1) applying steam under atmospheric conditions, or  
(2) applying subatmospheric pressure, with or without additional application of heat and/or of hot gases, or  
(3) applying heated or unheated CO<sub>2</sub>-free air.

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